

RTCA TO FAA— Report Your Present Position in the GPS Program

(continued from page 1)

My function is simple—to assume executive responsibility, for the Administrator, to assure that all the diverse elements inside the FAA work together to implement GPS/CNS technology as rapidly and effectively as possible. Additionally, my role is to work with industry and internationally to cooperate in developing the worldwide Global Satellite Navigation System that we all envision.

Position. Where are we right now.

The Department of Defense declared Initial Operating Capability (IOC) in December 1993. In February 1994, David Hinson, the FAA Administrator, stated that the satellite system is an operational and integrated part of the U.S. air traffic control system. What that means is that the DOT/DOD agreed-to specifications for civil use of GPS as published in the Federal Radio Navigation Plan (FRP) will now be adhered to by DOD. Before IOC, those guarantees were not in place as the 24 satellite constellation was in test status. There are still issues concerning the signal specification that need to be worked out with DOD, but we have an interim agreement with them that assures a safe and reliable signal.

Additionally, in February, one manufacturer certified a receiver to perform supplemental en route, terminal and non-precision approach navigation where authorized. This marks the beginning of public use supplemental non-precision approaches. Continental Airlines is already flying,

in revenue service, supplemental non-precision approaches under operations specification approval.

One of the questions I most often answer concerns the FAA commitment to install a GPS Wide Area Augmentation System (WAAS). It goes like this, "We thought the FAA was planning to approve Special Category I GPS approaches using local area differential and that we would be flying them shortly. Now, I hear that the FAA is going to develop a Wide Area Augmentation System for GPS that will give us Category I capability. What is the Wide Area System and will it negate Special Category I approaches when it is commissioned? This is causing me some concern because at my airport, we've already made a commitment to install a local area differential GPS."

The answer — which has been, and is being, widely coordinated with industry:

The Wide Area Augmentation System being developed by the FAA will be composed of approximately 24 ground monitors and at least three (3) geostationary satellites. The ground monitors will monitor the health of the satellite system and pass health messages to airborne receivers so that a pilot will affirmatively know when there is a reliable signal and also know when the signal is not useable for navigation. This, as many people know, is called integrity. How does that integrity message get to all aircraft flying in the system? It goes through the three (3) geostationary satellites so that the U.S. is effectively covered by a continuous GPS signal which provides integrity.

Wide Area Augmentation also provides additional satellite availability, which is necessary, because there are certain short periods of time each day when satellite geometry at a given location does not provide enough accuracy (defined in terms of Dilution of Precision or DOP) to provide certain levels of service. In other words, each geostationary satellite will provide an additional satellite ranging signal which will significantly improve geometry and signal availability. Geostationary satellites match earth orbit which means they are apparently stationary over a given point. Because of this characteristic, they can provide additional coverage equivalent to up to six (6) orbiting satellites.

There is a third component to Wide Area which will provide accuracy corrections. This is called Wide Area Differential GPS or WADGPS. The Department of Transportation is negotiating with DOD for approval to provide this accuracy component. If the accuracy component of Wide Area is not approved, then local area differential will be essential for accuracy during approach and landing. Either way, we believe the system will be accurate enough to provide nationwide Category I service. Wide Area would be much less expensive because it would not be necessary for the FAA to do a large procurement for local area systems. Wide Area has the capability to cover every airport in the United States where local could, but would be much more costly.

The FAA has already done extensive research and has proven less than ten meter accuracy and 6.2 second integrity on a test wide area system using a minimum of five (5) ground stations and a test Inmarsat II satellite. Local Area testing, in a research environment, has produced very near Category I accuracy and separate testing with miniature pseudolites has produced

consistently repeatable sub two centimeter accuracy with equivalent integrity.

The latter tests are the beginning of Category III testing, which will be fully underway later this year upon the award of a competitive contract for determination of Category III capability with GPS.

Wide Area Augmentation Specifications are completed, the system has been designed and the FAA will now begin the process to procure the system.

This is our present position.

Altitude. Following our position report format--the above accuracies have been produced in the vertical plane as well as even more precisely in the horizontal.

ETA to next reporting point. The schedule for Wide Area implementation is targeted to having an operational Wide Area Augmentation System in place at the end of 1996.

We believe that private operators under special approval will be flying local area Special Category I approaches this year. We believe privately established Local Area Differential Systems will proliferate rapidly and provide service to multiple runways at a given airport and at adjacent airports within twenty miles.

Succeeding Reporting Point. There are several important events on the horizon. There is a very significant ICAO Com/Div meeting coming up in March of 1995 when future approach architectures will be debated among nations and changes in the current ICAO approach and landing policies may be implemented. The Category III GPS studies will play a significant role in determining the U.S. position at that meeting.

After a robust Wide Area System is in place, the evolution from ground-based nav aids will take place. The FAA has committed to two-way satellite communications in the Pacific. That, combined with satellite navigation, will be the harbinger of reduced separation over the oceans.

Key Closing Points

This is our current position in the almost dizzying technical progress of satellite navigation and communication. Key points to close with:

1. The Wide Area Augmentation System is absolutely essential for en route integrity given a 24 satellite constellation. The other method for assuring integrity--Receiver Autonomous Integrity Monitoring (RAIM)--requires six (6) satellites in view with the right geometry. With 24 satellites in orbit, RAIM will not be available approximately 30 percent of the time. During that period of nonavailability, integrity must be supplemented by ground augmentation delivered through the geostationary satellite communications link or the operator will not know the health of the satellite. The FAA is actively exploring ways to improve RAIM availability.
2. One of the main advantages of Wide Area is that a precision approach capability will be available at many airports that may never have a local system.
3. The augmentation of GPS constellation signals by Wide Area also increases the availability of a robust signal to equal the availability now provided by a single ILS at a given airport.
4. Local Area Differential Systems are essential complements to the Wide Area Augmentation System and will enhance the robustness, safety and redundancy of the total GPS system in this country and will improve individual airport capability. They will do the same worldwide.
5. Not mentioned earlier, but in December 1993, DOD and DOT reached an understanding that allowed for joint management of GPS for civil use. This understanding did not place restraints on the establishment of Local Area Differential Systems and allowed the FAA to move ahead with the integrity and availability of Wide Area Augmentation Systems with the accuracy function to be determined later.

Space prohibits it, but there is more going on. Stay tuned. This is but one position report of many to be given. But the way I forgot to give you our current airspeed in trying to stay with the rapidly progressing state of the art--above Mach One. Couldn't fly that fast down the light lanes, could we Dave? ■

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November 15, 1993

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The Honorable James H. Quello
Chairman
Federal Communications Commission
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Dear Mr. Chairman:

I am writing in response to the Commission's Notice of Proposed Rule Making in PR Docket No. 93-253, which requests comments pertaining to the establishment of competitive bidding procedures to choose among mutually exclusive applications of initial licenses.

As you are well aware, this particular rulemaking is of critical importance, inasmuch as it will establish the ground rules for a new method of awarding radio licenses. I commend the Commission for moving forward on this Notice so expeditiously. I am aware that the new statute imposed tight deadlines on the Commission, and I would like to state at the outset that the Commission has done an extraordinary job drafting an extremely complex Notice in a very short timeframe.

I am, however, concerned about two aspects of the Notice. It is my hope that these comments will assist the Commission in its implementation of competitive bidding in a manner that is consistent with the intent of Congress.

My first concern occurs at paragraphs 28 and 29 of the Commission's Notice. The statutory text requires, and the Notice recognizes, that in order for there to be competitive bidding, that the subject spectrum enable subscribers "to receive communications signals" or to "transmit directly communications signals" [emphasis added].

That Congress included the term "directly" was not inadvertent. The term was incorporated into the legislation in order to distinguish between those who subscribe to spectrum-

based services and others whose use of the spectrum is incidental to some other service. In my view, the term "directly" in this instance in essence requires that subscribers operate a transmitter themselves.

Paragraphs 28 and 29 discuss the Commission's proposal "that licenses used in services as an intermediate link in the provision of a continuous, end-to-end service to a subscriber would be subject to competitive bidding". Inasmuch as these links are incidental to the provision of a different, and not necessarily spectrum-based, service, subjecting these licenses to competitive bidding procedures would be inappropriate.

My second concern relates to the proposed "Big LEO" satellite systems in the Mobile Satellite Service ("MSS"). It is clear to me that these systems will advance important U.S. policy goals, including maintaining America's lead in important technologies and the expansion of the existing telecommunications infrastructure. They will also promote the creation of new jobs throughout the industry and enhance the global competitiveness of the United States in mobile communications technology.

I am concerned, however, that the Commission's limited discussion of the treatment of the pending Big LEO applications in the competitive bidding Notice is an indication that the Commission may be misinterpreting the intent of Congress with respect to licensing Big LEO systems. In its Notice, it appears that the Commission has failed to take notice of important statutory language in the new law, as well as relevant legislative history, which requires the Commission to continue to use engineering solutions, negotiation, threshold qualifications, service regulations and other means in order to avoid mutual exclusivity in pending application and licensing proceedings, and thereby avoid auctions and lotteries.

As a general proposition, by granting to the Commission the authority to assign licenses by auction, it was never the intent of Congress for auctions to replace the Commission's responsibilities to make decisions that are in the public interest. Rather, the competitive bidding authority was always intended to address those situations where the Commission could not either narrow the field of applicants or select between applicants based upon substantive policy considerations.

The Committee expects the Commission to continue to exercise its responsibilities to determine how spectrum should be used in the public interest and who are the best qualified to undertake that use.

To underscore that auctions are not a substitute for reasoned decision-making, the new statute specifies (at Section

309(j)(6)(E)) that the Commission is not to abandon its traditional methods of avoiding mutual exclusivity. Congress clearly had the Big LEO proceeding in mind when it added this language to the bill because it believed that mutual exclusivity could be avoided in that proceeding.

A brief review of the relevant legislative history should assist the Commission in its deliberations in both the competitive bidding docket and the Big LEO proceeding. In the original House Report language (House Report No. 103-111, at p. 258) from which this statutory subsection was drawn, the Committee stated:

In connection with application and licensing proceedings, the Commission should, in the public interest, continue to use engineering solutions, negotiation, threshold qualifications, service rules, and other means in order to avoid mutual exclusivity. The licensing process, like the allocation process, should not be influenced by the expectation of federal revenues and the Committee encourages the Commission to avoid mutually exclusive situations, as it is in the public interest to do so. The ongoing MSS (or "Big LEO") proceeding is a case in point. The FCC has and currently uses certain tools to avoid mutually exclusive licensing situations, such as spectrum sharing arrangements and the creation of specific threshold qualifications, including service criteria. These tools should continue to be used when feasible and appropriate [emphasis added].

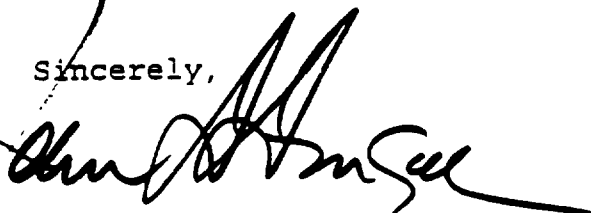
In light of the provisions of the House Report, the final statutory language signed by the President, and the presence of viable spectrum sharing plans, such as the one contained in Motorola Satellite's and Loral Qualcomm's joint submission, it is clear that the Commission has an obligation to attempt to avoid mutual exclusivity among qualified applicants in the Big LEO proceeding. While the contents of paragraph 156 of the Notice may provide a healthy incentive for the various applicants to conclude their negotiated rulemaking successfully, I trust that the Commission is aware of its own responsibilities in this regard.

As I noted at the outset, the Commission's Notice represents an extraordinary effort in a very tight timeframe, and I congratulate you for the job that you have done. I ask that a copy of this letter be made part of the Commission's record in

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this proceeding, and hope that it is useful to you as the Commission deliberates on the appropriate uses of its competitive bidding authority. If I or the Committee staff can be of any assistance to you, please do not hesitate to contact me. I look forward to reviewing your decision, and to receiving your response to these comments

Sincerely,

A handwritten signature in black ink, appearing to read "John D. Dingell", with a large, sweeping flourish extending from the end of the name.

JOHN D. DINGELL
CHAIRMAN

CERTIFICATE OF SERVICE

I, Pantelis Michalopoulos, hereby certify that copies of the foregoing Comments of Motorola Satellite Communications, Inc. on Notice of Proposed Rulemaking were served by first-class mail, postage prepaid, this 5th day of May, 1994 on the following persons:

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